

U.S. Department of Energy Next Generation Natural Gas Vehicle (NGNGV) Engine & Vehicle Projects

NGVTF, April 14-15, 2004, Sacramento, California

National Renewable Energy Laboratory

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**NGNGV is also supported by the South Coast Air Quality
Management District and the California Energy Commission**

Pre-NGNGV

Alternative Motor Fuels Act of 1988 (AMFA): Public law 100-494. Encouraged the development, production and demonstration of alternative motor fuels and AFVs.

Clean Fuel Fleet Program: Federal program requiring fleet purchase of Clean_Fuel Vehicles beginning in 1988.

Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA): Congestion Mitigation and Air Quality Improvement (CMAQ)

Energy Policy Act (EPACT): A broad ranging act requiring the purchase of AFVs by the federal fleet.

NGNGV Program

Then... (2000)

NO_x & PM standards- 4.0 & 0.1 g/bhp

NG R&D funding is flat/decline

NG vehicle sales flat/decline

Difficult business case

- Fleet

- OEM development

Federal incentives- transit bus

State (CA) incentive

- Carl Moyer

NGNGV established to coordinate R&D efforts

NGNGV Program

Workshops

Engine and vehicle OEMs, fleet operators, industry and trade associations, funding partners, utilities and fuel distributors, equipment suppliers, national labs and research groups, industry research groups, consultants and universities

NGNGV Program

Workshop Results (for engines & vehicles)

- Engine R&D to meet *proposed* 2007/10 emission standards (0.5 NO_x, 0.01 PM)
 - Lean-burn
 - Stoichiometric
 - Exhaust After-treatment
- Market Research: Identify & define best application
- Near-Term Engine/Vehicle needs exist right now!

NGNGV Program

Commercialization



Near-Term Engine/Vehicle
Development

Long-Term Engine/Vehicle
Development

Engine Laboratory
Development

Proof of Concept

NGNGV Program

Now... (2004)

NO_x & PM standards- 2.5 NO_x + nmHC, 0.1 PM

NG R&D funding flat/declining

NG engine/vehicle sales flat (domestically)

Difficult business case

Fleet

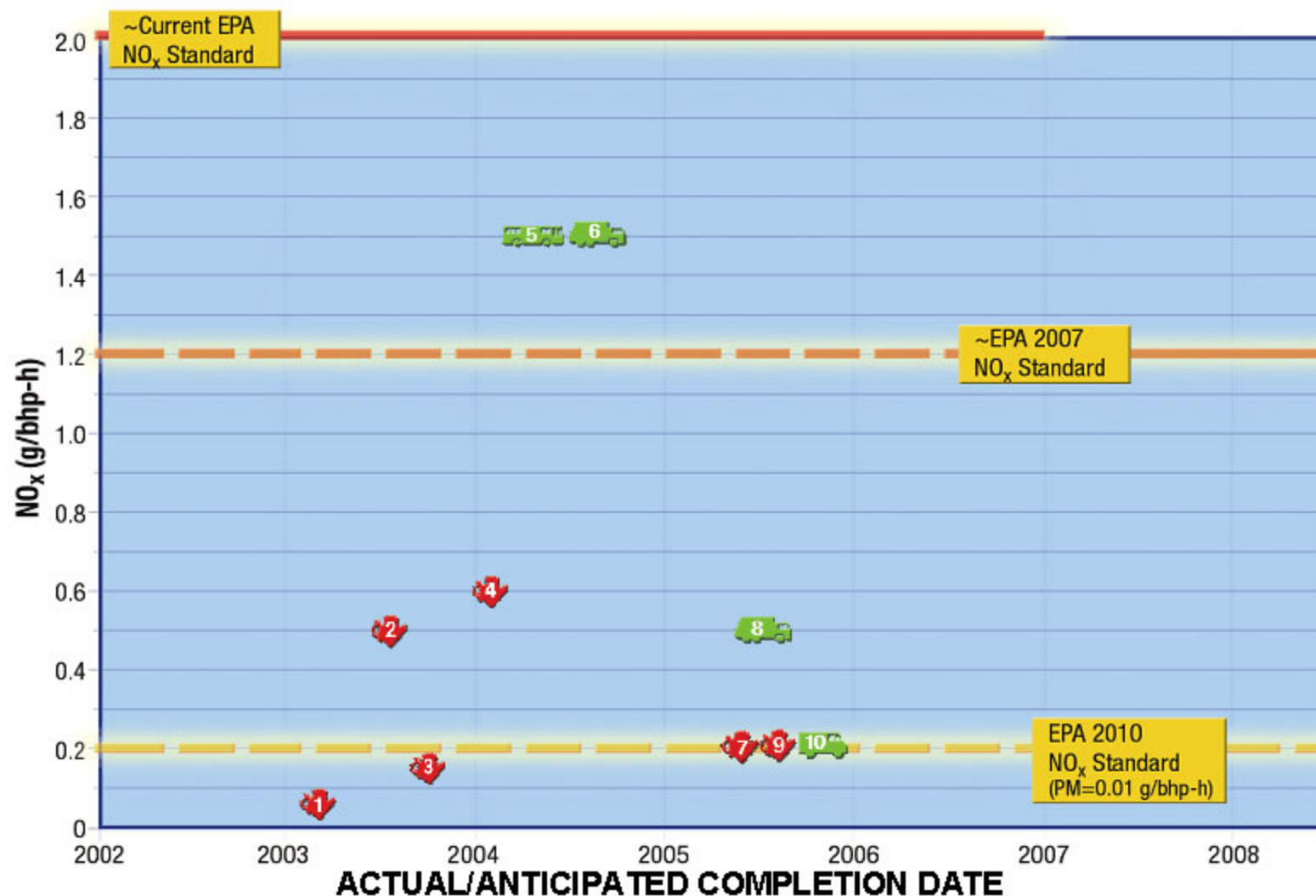
OEM development

Emissions based incentives diminishing

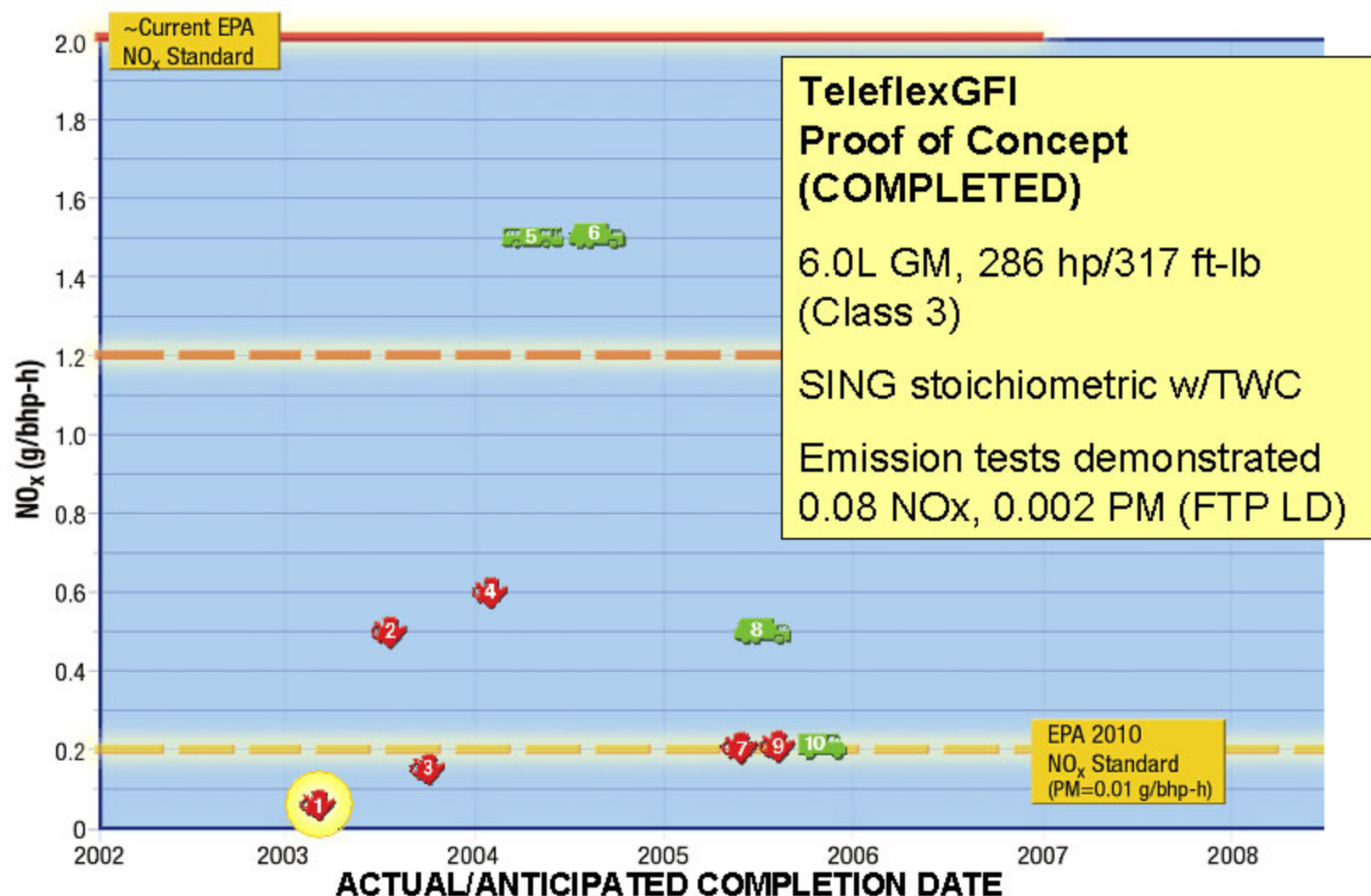
NGNGV Program



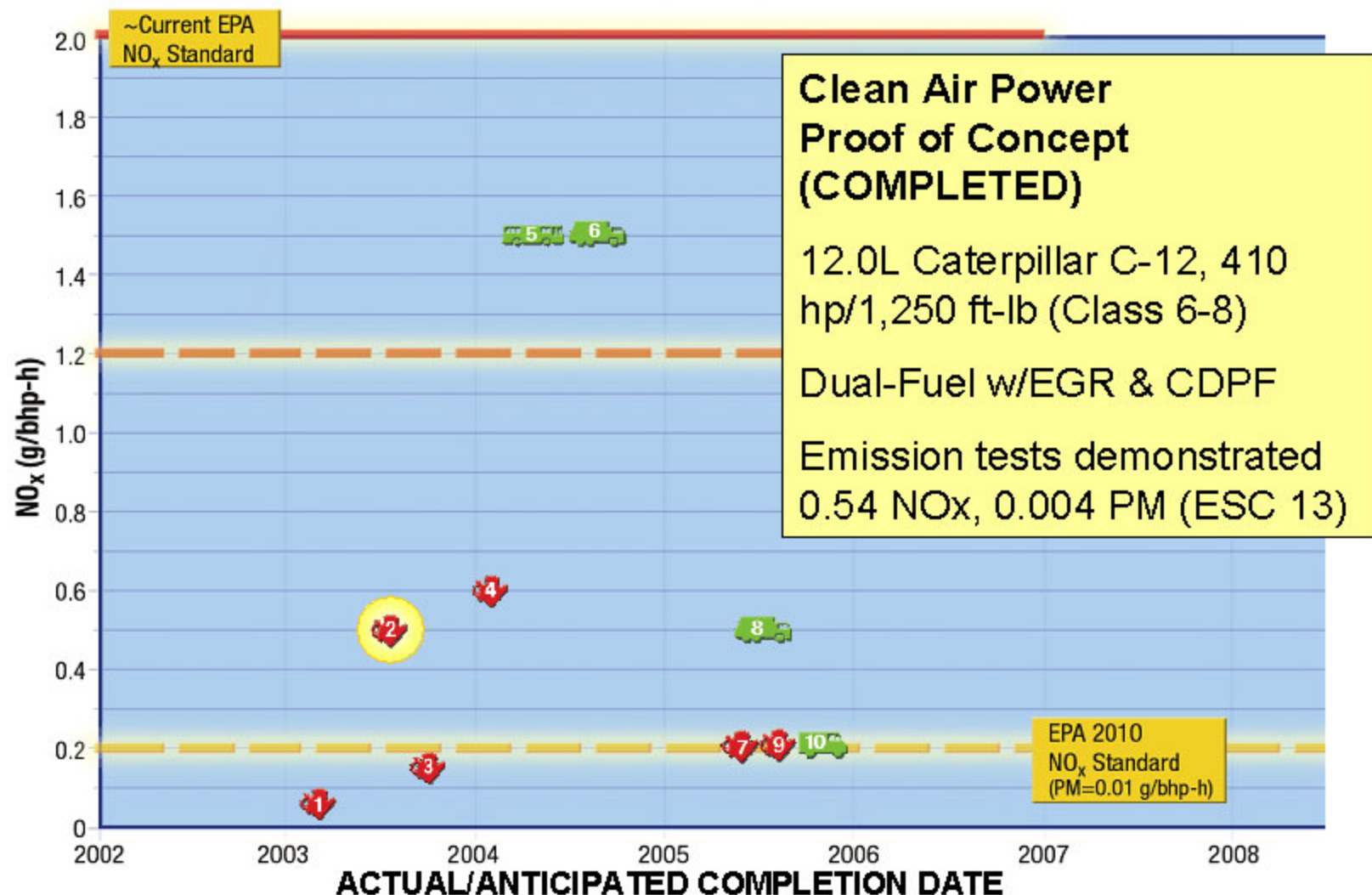
NGNGV Projects



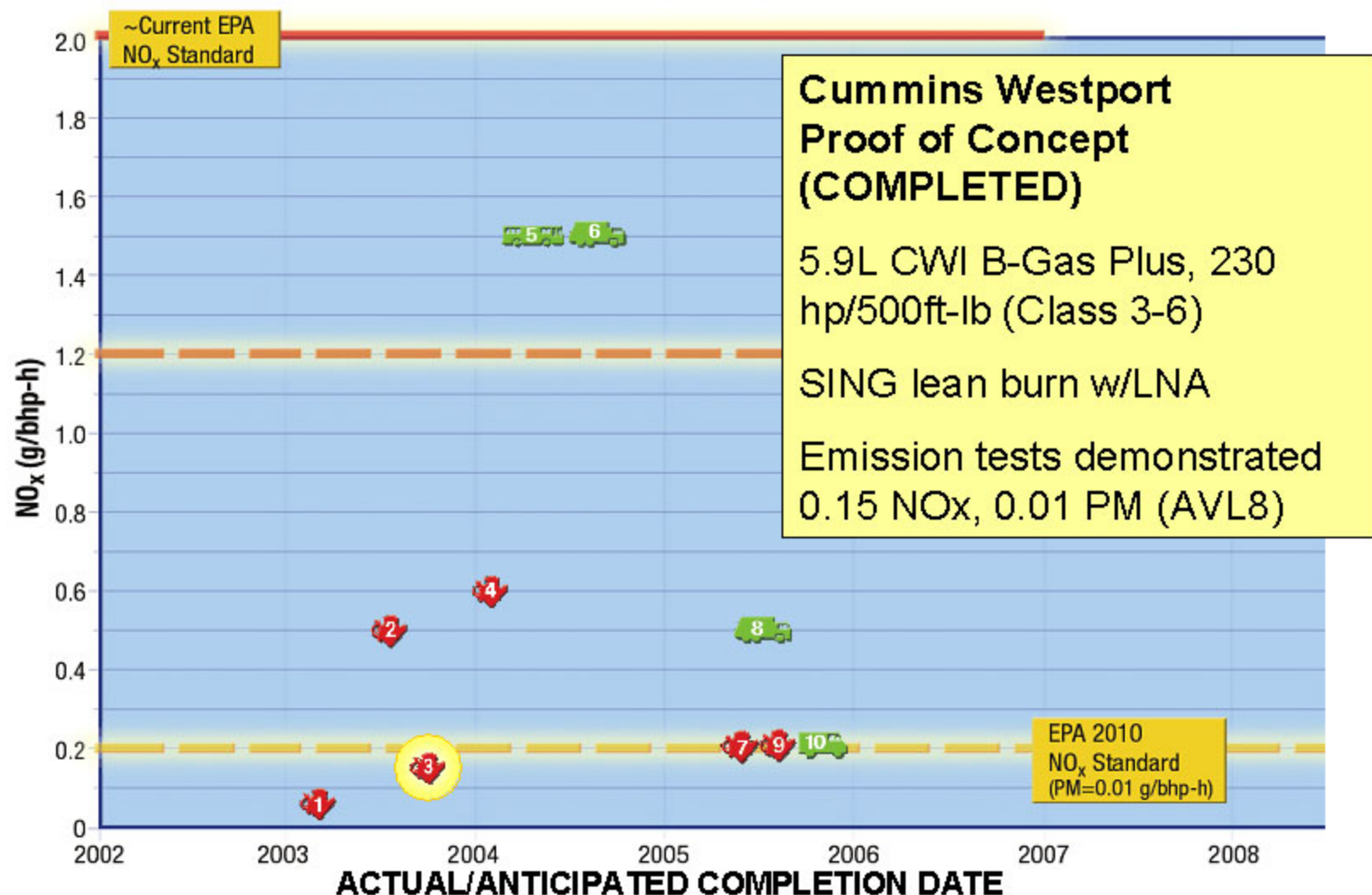
NGNGV Projects



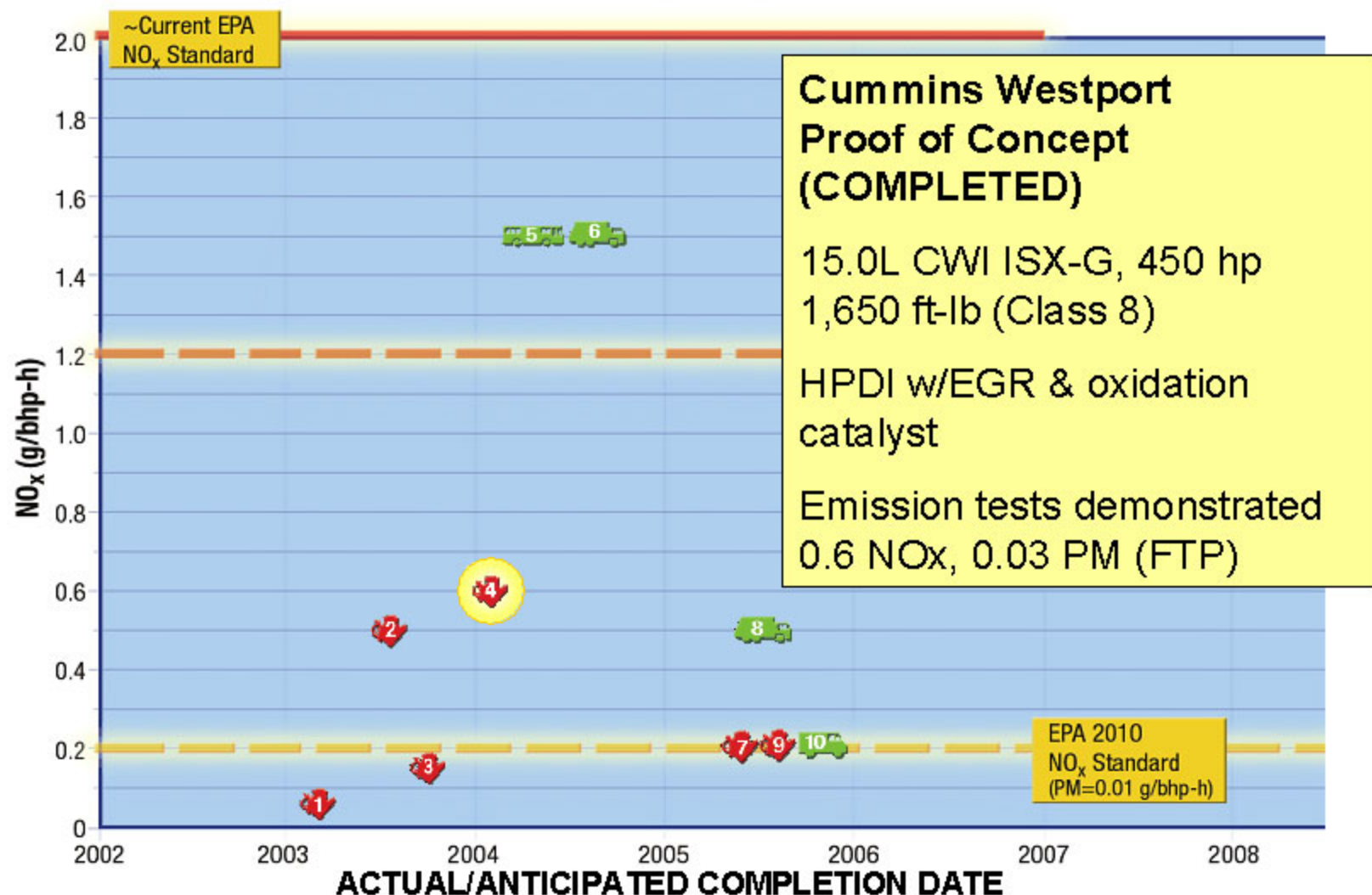
NGNGV Projects



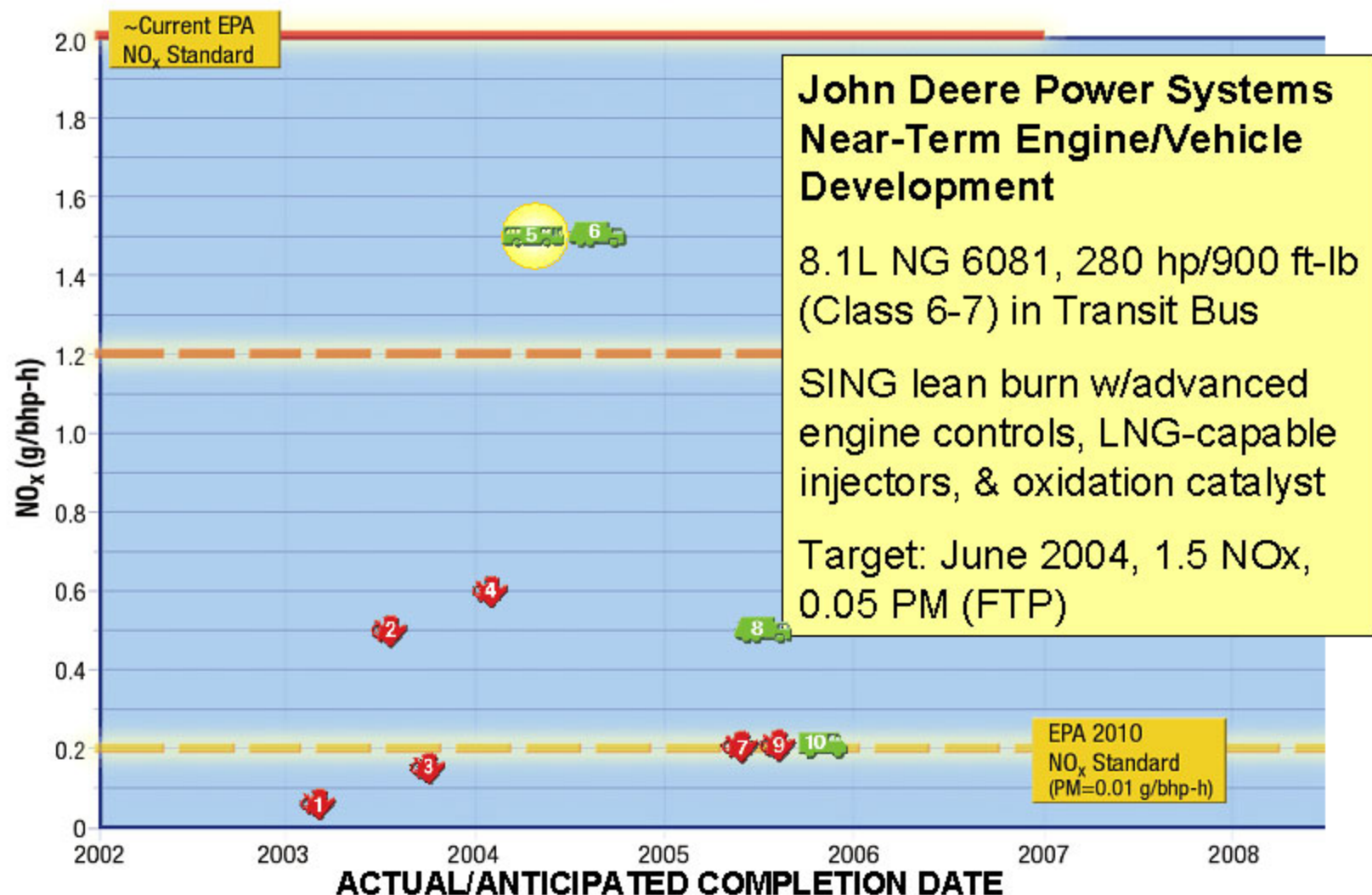
NGNGV Projects



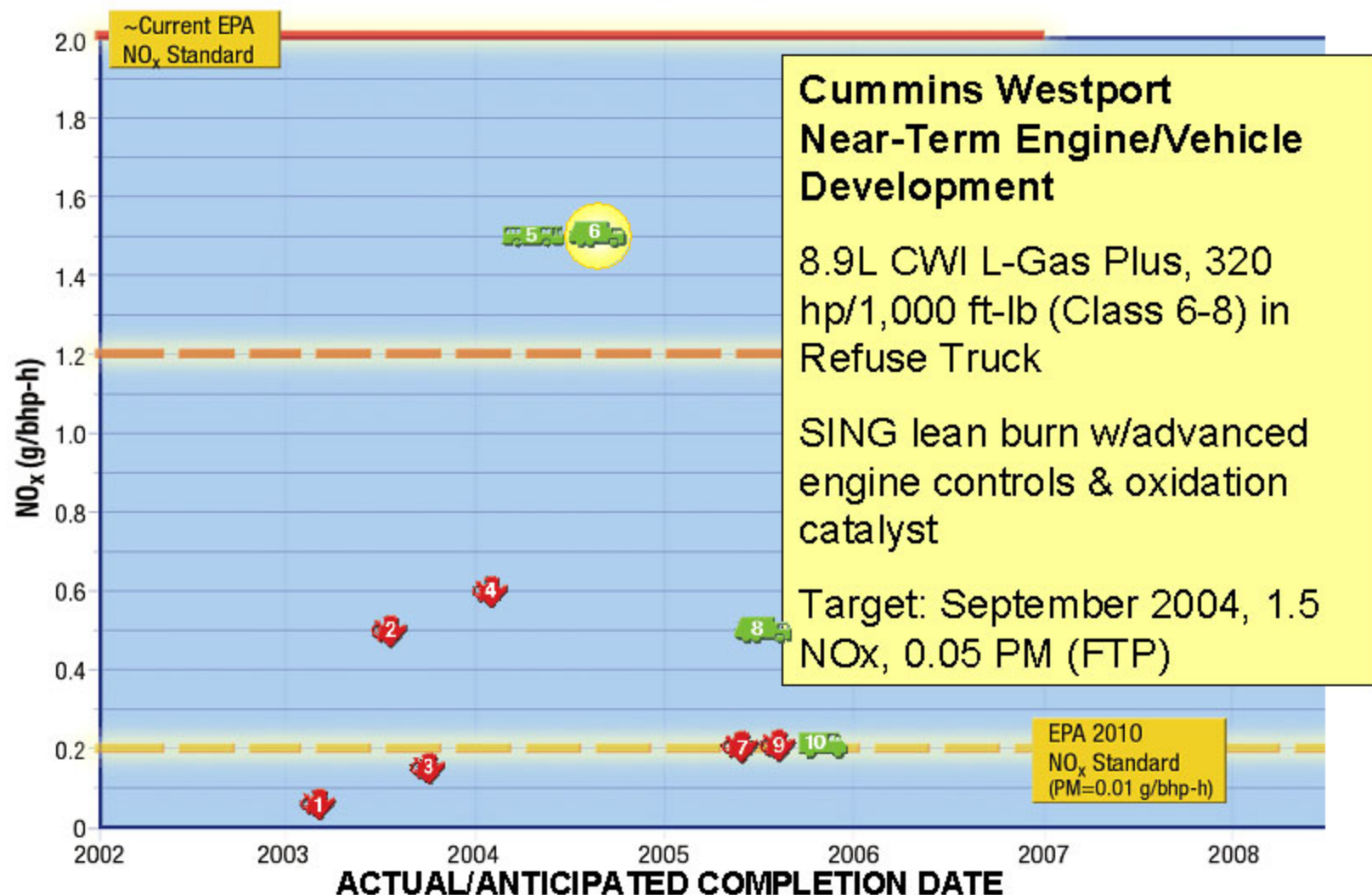
NGNGV Projects



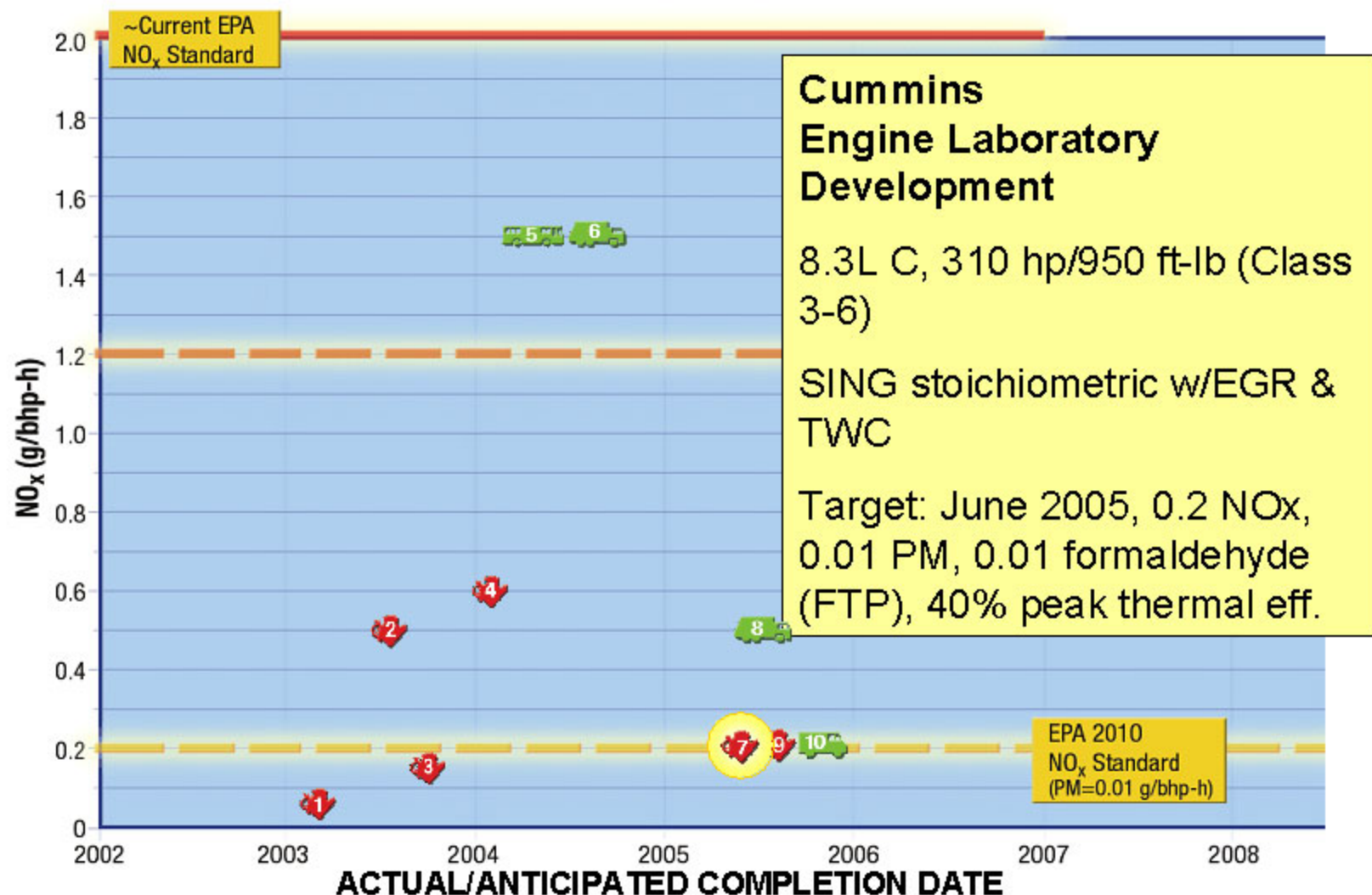
NGNGV Projects



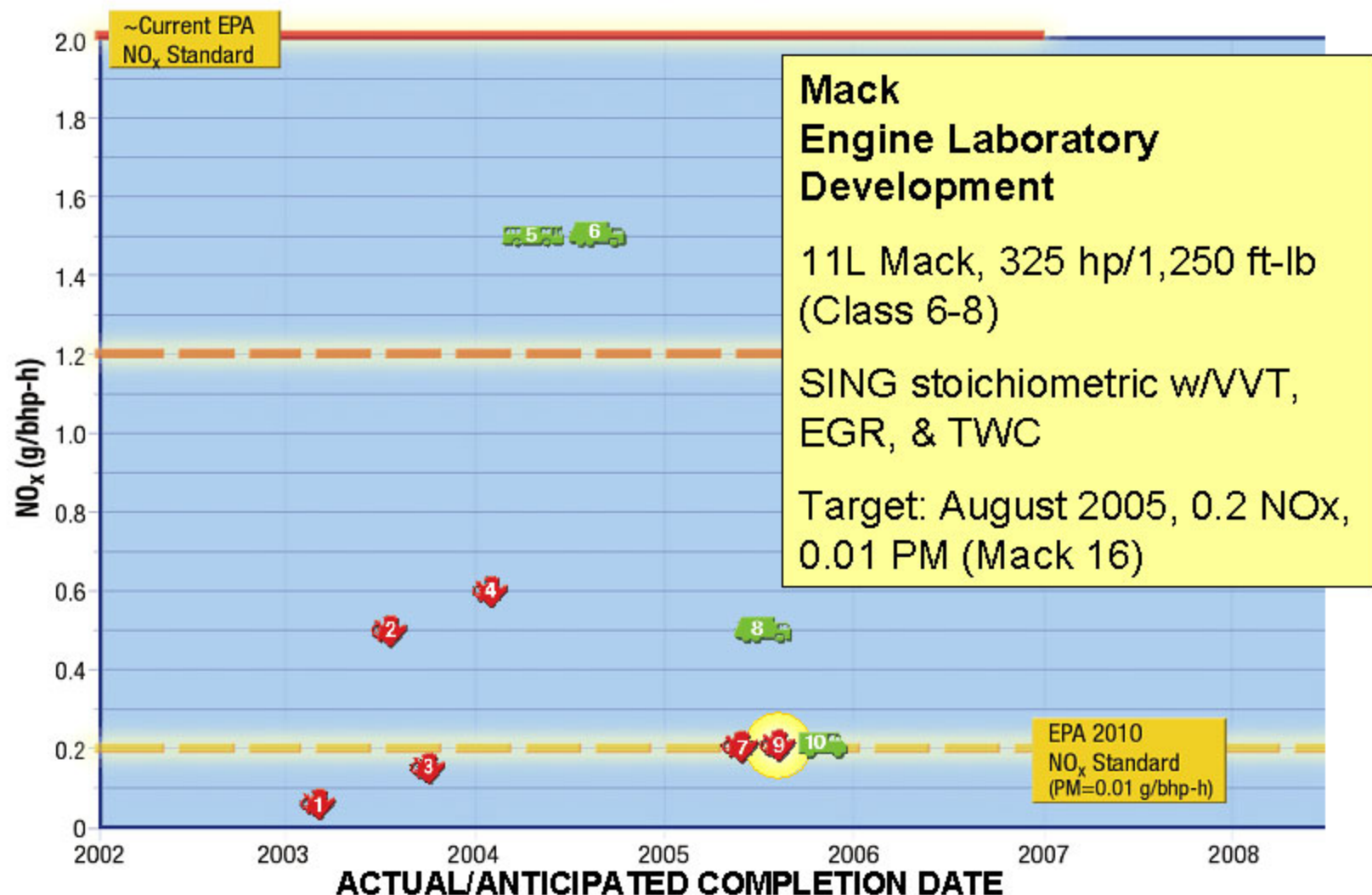
NGNGV Projects



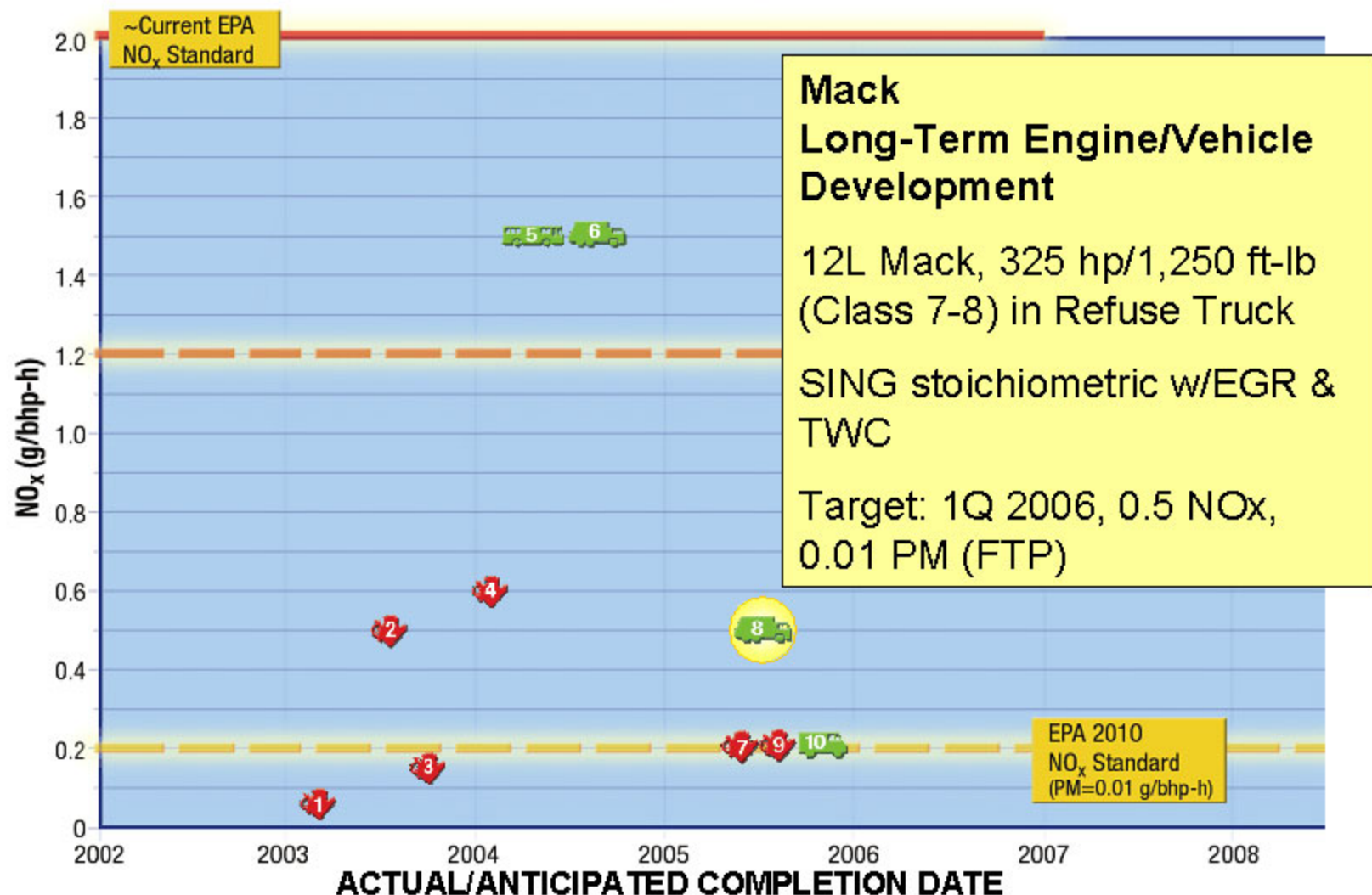
NGNGV Projects



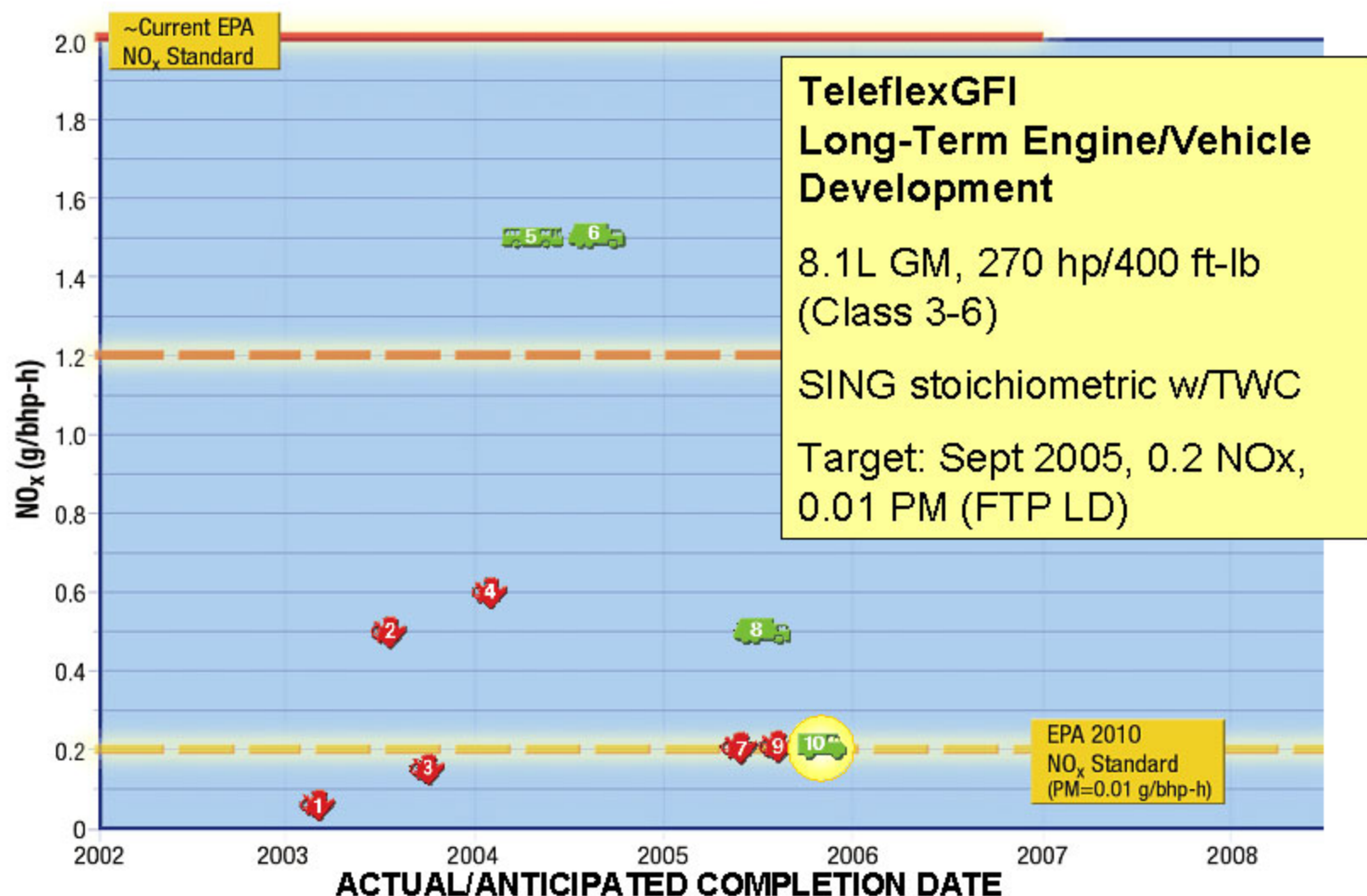
NGNGV Projects



NGNGV Projects



NGNGV Projects



NGNGV Program

SING development is progressing

Near-term commercial engines available soon

SI, EGR, TWC product aiming at 2010 stds

DING product laboratory demonstrated

Needs more R&D for 2010 capability